

Pending Claims

2. (Twice Amended) A bone graft substitute composition comprising:

- (a) calcium sulfate;
- (b) a mixing solution;
- (c) a cellulose derivative; and
- (d) demineralized bone matrix.

3. (Amended) The bone graft substitute composition of claim 2, comprising approximately 40% demineralized bone matrix by dry weight.

8. (Amended) A bone graft substitute composition comprising:

- (a) calcium sulfate;
- (b) a mixing solution;
- (c) a cellulose derivative; and
- (d) a bioactive agent selected from the group consisting of growth factors, bone autograft, analgesics, bone marrow, bone allograft, and parenchymal and mesenchymal cells.

12. (Twice Amended) A bone graft substitute composition comprising:

- (a) approximately 80-120 parts medical grade calcium sulfate hemihydrate by weight;
- (b) approximately 21-250 parts sterile water by weight;
- (c) approximately 1-40 parts carboxymethylcellulose by weight; and
- (d) approximately 10-100 parts demineralized bone matrix by weight.

13. The bone graft substitute composition of claim 2, wherein the mixing solution is selected from a group consisting of sterile water, an inorganic salt, and a cationic surface active agent.

14. The bone graft substitute composition of claim 13, wherein the cationic surface agent is selected from a group consisting of sodium chloride, phosphate buffered saline, potassium chloride, sodium sulfate, ammonium sulfate, ammonium acetate, and sodium acetate.

15. The bone graft substitute composition of claim 2, wherein the mixing solution comprises sterile water.

16. The bone graft substitute composition of claim 2, wherein the cellulose derivative

is selected from a group consisting of sodium carboxymethylcellulose, methylcellulose, hydroxypropyl methylcellulose, ethylcellulose, hydroxyethylcellulose and cellulose acetate butyrate.

17. The bone graft substitute composition of claim 2, wherein the cellulose derivative comprises carboxymethylcellulose.

18. The bone graft substitute composition of claim 2, wherein the calcium sulfate comprises calcium sulfate hemihydrate.

19. The bone graft substitute composition of claim 2, wherein the calcium sulfate comprises calcium sulfate hemihydrate, the mixing solution comprises sterile water, and the plasticizing substance comprises carboxymethylcellulose.

20. The bone graft substitute composition of claim 19, comprising approximately 100 parts calcium sulfate hemihydrate by weight, approximately 11.1 parts carboxymethylcellulose by weight, approximately 162 parts water by weight, and approximately 69.4 parts demineralized bone matrix by weight.

21. The bone graft substitute composition of any one of claims 2, 3, and 12-20, further comprising a bone allograft.

22. The bone graft substitute composition of claim 8, wherein the mixing solution is selected from a group consisting of sterile water, an inorganic salt, and a cationic surface active agent.

23. The bone graft substitute composition of claim 22, wherein the cationic surface agent is selected from a group consisting of sodium chloride, phosphate buffered saline, potassium chloride, sodium sulfate, ammonium sulfate, ammonium acetate, and sodium acetate.

24. The bone graft substitute composition of claim 8, wherein the mixing solution comprises sterile water.

25. The bone graft substitute composition of claim 8 wherein the cellulose derivative is selected from a group consisting of sodium carboxymethylcellulose, methylcellulose, hydroxypropyl methylcellulose, ethylcellulose, hydroxyethylcellulose and cellulose acetate butyrate.

26. The bone graft substitute composition of claim 8, wherein the cellulose derivative comprises carboxymethylcellulose.

27. The bone graft substitute composition of claim 8, wherein the calcium sulfate comprises calcium sulfate hemihydrate.

28. The bone graft substitute composition of claim 8, wherein the bioactive agent is a growth factor.

29. The bone graft substitute composition of claim 8, wherein the bioactive agent is a bone autograft.

30. The bone graft substitute composition of claim 8, wherein the bioactive agent is an analgesic.

31. The bone graft substitute composition of claim 8, wherein the bioactive agent is bone marrow.

32. The bone graft substitute composition of claim 8, wherein the bioactive agent is a bone allograft.

33. The bone graft substitute composition of claim 8, wherein the bioactive agent is parenchymal cells.

34. The bone graft substitute composition of claim 8, wherein the bioactive agent is mesenchymal cells.

35. A method of making a bone graft substitute composition, the method comprising:
providing a first composition comprising calcium sulfate, a cellulose derivative and demineralized bone matrix; and

contacting the first composition with a mixing solution to form the bone graft substitute composition.

36. The method of claim 35, wherein the first composition further comprises a bone allograft.

37. The method of claim 35, further comprising forming the bone graft substitute composition into a putty.

38. The method of claim 35, wherein the calcium sulfate comprises calcium sulfate hemihydrate, the cellulose derivative comprises carboxymethylcellulose, and the mixing solution comprises sterile water.